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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,604	09/29/2005	Christian Reufer	032301.429	2889
25461	7590	12/28/2006	EXAMINER	
SMITH, GAMBRELL & RUSSELL SUITE 3100, PROMENADE II 1230 PEACHTREE STREET, N.E. ATLANTA, GA 30307-3592			WONG, EDNA	
			ART UNIT	PAPER NUMBER
			1753	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		12/28/2006	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/551,604	REUFER ET AL.	
	Examiner	Art Unit	
	Edna Wong	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on ____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) Claim(s) ____ is/are allowed.
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) ____ is/are objected to.
- 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on ____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. ____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ . |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>September 29, 2005</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: ____ . |

Claim Objections

Claim 1 is objected to because of the following informalities:

Claim 1

line 1, it is suggested that the words "in which" be amended to the words -- comprising the step of --.

line 2, it is suggested that the words "is passed" be amended to the word -- passing --, and moved up to line 1.

line 8, the word -- a -- should be inserted after the word "with".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

I. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1

lines 2-3, "the anode space" lacks antecedent basis.

line 3, it appears that "an anode space" is the same as the anode space recited

in claim 1, lines 2-3. However, it is unclear if it is. If it is, then it is suggested that the word "an" be amended to the word -- the --.

lines 5-6, it appears that "a reactor" is the same as the reactor recited in claim 1, line 3. However, it is unclear if it is. If it is, then it is suggested that the word "a" be amended to the word -- the --.

line 6, it appears that "an MEA" is the same as the MEA recited in claim 1, line 4. However, it is unclear if it is. If it is, then it is suggested that the word "an" be amended to the word -- the --.

line 7, "one or both electrode layers of which were produced" lack antecedent basis. See also claim 2, line 2; and claim 3, line 2.

Claim 2

lines 1-2, it appears that "an MEA" is the same as the MEA recited in claim 1, line 4. However, it is unclear if it is. If it is, then it is suggested that the word "an" be amended to the word -- the --.

line 2, it appears that "a suspension" is the same as the suspension recited in claim 1, line 9. However, it is unclear if it is. If it is, then it is suggested that the word "a"

be amended to the word -- the --.

lines 2-3, recites "containing carbon black, graphite or platinum-doped carbon black is used". The suspension already is "containing" as recited in claim 1, line 9. Is the "carbon black, graphite or platinum-doped carbon black is used" further limiting the suspension recited in claim 1, line 9?

If it is, then it is suggested that the word -- further -- be inserted after the word "suspension" in claim 2, line 2.

If not, then the suspension has two separate, independent definitions. What is their relationship?

line 2, it appears that the "carbon black" is the same as the carbon black recited in claim 1, line 7. However, it is unclear if it is. If it is, then it is suggested that the word -- the -- be inserted after the word "containing".

line 3, it appears that the "graphite" is the same as the graphite recited in claim 1, line 8. However, it is unclear if it is. If it is, then it is suggested that the word -- the -- be inserted after the word "black,".

Claim 3

line 2, it appears that "a reactor" is the same as the reactor recited in claim 1, line

3. However, it is unclear if it is. If it is, then it is suggested that the word "a" be amended to the word -- the --.

line 2, it appears that "an MEA" is the same as the MEA recited in claim 1, line 4. However, it is unclear if it is. If it is, then it is suggested that the word "an" be amended to the word -- the --.

lines 2-3, recites "a **suspension** as in Claim 1". However, claim 3, line 1, recites "A **method** as in Claim 1".

Claim 1 cannot be directed to both a method and a suspension.

lines 2-3, it appears that "a suspension" is the same as the suspension recited in claim 1, line 9. However, it is unclear if it is. If it is, then it is suggested that the word "a" be amended to the word -- the --.

line 3, "the cation exchange membrane" lacks antecedent basis. Is this the same as the cation exchanger membrane recited in claim 1, line 6?

line 4, "the liquid medium" lacks antecedent basis. Is this the same as the liquid suspension medium recited in claim 1, line 9?

lines 4-5, "the membrane coated on both sides" lacks antecedent basis.

Claim 4

line 2, it appears that "an organic compound" is the same as the organic compound recited in claim 1, line 1. However, it is unclear if it is. If it is, then it is suggested that the word "an" be amended to the word -- the --.

line 2, the alternative expression of the Markush group is improper. MPEP § 2173.05(h). The words "from among" should be amended to the phrase -- is selected from the group consisting of --; and the word -- and -- should be inserted after the word "amides," in line 3.

lines 2-3, "the cyclic ethers, N-substituted amides, carbonyl compounds" lacks antecedent basis.

lines 3-4, the phrase "especially ketones, alkylaromatic compounds and alkylheteroaromatic compounds" is indefinite.

Claim 5

line 2, it appears that "a cyclic ether" is further limiting the organic compound recited in claim 1, line 1. However, it is unclear if it is. If it is, then it is suggested that the

phrase "which is characterized by the fact" be amended to the phrase -- wherein the organic compound is --.

line 2, the alternative expression of the Markush group is improper. MPEP § 2173.05(h). The words "from among" should be amended to the phrase -- is selected from the group consisting of --.

lines 2-3, "the furans, dihydrofurans and tetrahydrofurans, 1,2-pyrans, and 1,4-pyrans and their di- and tetrahydro compounds" lacks antecedent basis.

lines 2-3, the word "and" is used four (4) times. The scope of the Markush group is unclear.

line 3-4, the phrase "as well as the 1,4-pyrones and their di- and tetrahydro compounds" is indefinite.

lines 3-4, "the 1,4-pyrones and their di- and tetrahydro compounds" lack antecedent basis.

lines 4-5, "the hydrogenated furans, pyrans and pyrones" lack antecedent basis.

line 6, the words “especially methoxylated” is indefinite.

Claim 6

line 2, it appears that “an amide” is further limiting the organic compound recited in claim 1, line 1. However, it is unclear if it is. If it is, then it is suggested that the phrase “which is characterized by the fact” be amended to the phrase -- wherein the organic compound is --.

line 2, the alternative expression of the Markush group is improper. MPEP § 2173.05(h). The words “from among” should be amended to the phrase -- is selected from the group consisting of --.

lines 2-4, “the lactams with 5-7 ring members, the N-acylated saturated and unsaturated N-heterocycles and the open-chain N-alkyl or N,N-dialkyl fatty acid amides” lack antecedent basis.

lines 3, the word “and” is used two (2) times. The scope of the Markush group is unclear.

line 5, the words “especially methoxylated” is indefinite.

Claim 7

line 2, it appears that “a ketone” is further limiting the organic compound recited in claim 1, line 1. However, it is unclear if it is. If it is, then it is suggested that the phrase “which is characterized by the fact” be amended to the phrase -- wherein the organic compound is --.

line 3, the words “especially methoxylated” is indefinite.

Claim 8

line 2, it appears that “a methyl-substituted aromatic compound or heteroaromatic compounds” is further limiting the organic compound recited in claim 1, line 1. However, it is unclear if it is. If it is, then it is suggested that the phrase “which is characterized by the fact” be amended to the phrase -- wherein the organic compound is --.

line 3, the words “especially methoxylated” is indefinite.

Claim 9

lines 2-3, “the alcohol corresponding to the alkoxy group” lacks antecedent basis. Also, it is unclear what is the relationship between the alcohol corresponding to the alkoxy group and the alcohol with 1-4C recited in claim 1, line 2.

lines 2-3, "the alkoxy group" lacks antecedent basis.

line 3, "the solvent" lacks antecedent basis.

line 3, the words "especially 1-25 volts" is indefinite.

Claim 10

line 2, "the alcohol mixture" lacks antecedent basis. Is this the same as the mixture recited in claim 1, line 1-2?

II. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: the anodic alkoxylation step.

Claim 1

line 2, recites "is passed through the anode space". This passing step does not carry out the anodic alkoxylation because there is no current density or voltage applied.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. Claims 1-2 and 4-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Merk et al. (US Patent No. 6,398,938 B2).

Merk teaches a method for anodic alkoxylation of an organic compound (col. 10, lines 5-9; and col. 11, lines 19-22 and 33-40) comprising the step of:

passing a mixture containing the organic compound (col. 10, lines 5-9; and col. 11, lines 19-22 and 33-40) and an alcohol with 1-4 C atoms (col. 6, lines 61 to col. 7, line 7) through the anode space (= the reaction solution is continuously pumped in circulation over the electrochemically active anode and starting material is continuously supplied to the circulation) [col. 8, line 67 to col. 9, line 3] of a reactor (= a partitioned cell) [col. 6, lines 21-43] divided into an anode space (= anolyte) and a cathode space (= catholyte) by means of a membrane electrode assembly (MEA) [= a plane-parallel electrode arrangement] (col. 6, lines 22-26), wherein the MEA consists of a membrane (= an ion-exchange membrane), both sides of which are provided with electrode layers (= the electrodes in the partitioned cell are preferably disposed in plane-parallel relationship with a 0 mm gap) [col. 6, lines 34-43],

which is characterized by the fact that the membrane is a cation exchange membrane or a microporous polypropylene membrane (col. 6, lines 30-34), and one or both electrode layers were produced using a carbon black and/or graphite (col. 3, lines 53-56), which can be doped with heavy metal (col. 3, lines 57-63), in a suspension containing a liquid suspension medium (= the solution containing the particles that form the layer) [col. 5, lines 7-12].

The suspension contains carbon black, graphite or platinum-doped carbon black (col. 3, lines 48-63).

The organic compound is selected from the group consisting of cyclic ethers (col. 11, lines 33-40), N-substituted amides (col. 11, lines 19-22), carbonyl compounds (acetone) [col. 11, line 55], especially ketones, alkylaromatic compounds and alkylheteroaromatic compounds (col. 11, lines 53-61).

The cyclic ethers are selected from the group consisting of furans, dihydrofurans and tetrahydrofurans, 1,2-pyrans, and 1,4-pyrans and their di- and tetrahydro compounds, as well as the 1,4-pyrones and their di- and tetrahydro compounds, where in the case of the hydrogenated furans, pyrans and pyrones at least one C atom bonded to an ether oxygen atom has a hydrogen atom, is methoxylated or ethoxylated, especially methoxylated (col. 11, lines 33-40).

The N-substituted amides are selected from the group consisting of lactams with 5-7 ring members, N-acylated saturated and unsaturated N-heterocycles and the open-chain N-alkyl or N,N-dialkyl fatty acid amides, where a carbon atom bonded to a nitrogen has at least one hydrogen atom, is methoxylated or ethoxylated, especially methoxylated (col. 10, line 66 to col. 11, line 22).

The organic compound is a ketone with a methyl group or methylene group bonded to the carbonyl C atom is methoxylated or ethoxylated, especially methoxylated (= acetone) [col. 10, lines 5-6; and col. 11, line 55].

The alkoxylation is carried out in the alcohol corresponding to the alkoxy group

as the solvent (col. 6, line 61 to col. 7, line 7), at a voltage in the range from 1-50 volts, especially 1-25 volts (= from the current densities, $V = IR$) [col. 5, lines 21-28].

The alcohol mixture to be alkoxylated is sent through the anode space and then through the cathode space (= circulation) [col. 8, line 67 to col. 9, line 3].

The method of Merk differs from the instant invention because Merk does not disclose the following:

a. Wherein the one or both electrode layers were produced using a sulfonated polyfluorinated polymer or copolymer in the suspension, as recited in claim 1.

Merk teaches that the electrodes in the partitioned cell are preferably disposed in plane-parallel relationship with a 0 mm gap (col. 6, lines 34-43). The partitioning medium includes a copolymer of tetrafluoroethylene and a perfluorinated monomer that contains sulfo groups (col. 6, lines 30-34).

The anode is first prepared in situ by forming on the support a catalytically active layer by precoating (col. 8, lines 1-13).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the one or both electrode layers described by Merk with wherein the one or both electrode layers were produced using a sulfonated polyfluorinated polymer or copolymer because the anodically polarized layer disclosed by Merk would have been disposed directly on the partitioning medium because there is

a 0 mm gap between the electrodes. Thus, the anodically polarized layer of carbon black and/or graphite (col. 3, lines 53-56), which can be doped with heavy metal (col. 3, lines 57-63), would have been in contact with the partitioning medium of a copolymer of tetrafluoroethylene and a perfluorinated monomer that contains sulfo groups (col. 6, lines 30-34).

Using a sulfonated polyfluorinated polymer or copolymer in the suspension appears to be a mere optimization which solves no stated problems and produces no unexpected results.

b. Wherein the organic compound is a methyl-substituted aromatic compound or heteroaromatic compounds is methoxylated or ethoxylated, especially methoxylated, as recited in claim 8.

Merk teaches the alkoxylation of alkyl aromatics (col. 11, line 53).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the organic compound described by Merk with wherein the organic compound is a methyl-substituted aromatic compound or heteroaromatic compounds is methoxylated or ethoxylated because structural relationships may provide the requisite motivation or suggestion to modify known compounds to obtain new compounds. For example, a prior art compound may suggest its homologs because homologs often have similar properties and therefore chemists of ordinary skill would ordinarily contemplate making them to try to obtain compounds with

improved properties (MPEP § 2144.08(II)(A)(4)(c) and §2144.09).

II. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Merk et al.** (US Patent No. 6,398,938 B2) as applied to claims 1-2 and 4-10 above, and further in view of **Thorn et al.** (US Patent no. 5,476,580).

Merk is as applied above and incorporated herein.

The method of Merk differs from the instant invention because Merk does not disclose wherein the electrode layers of which were produced with a suspension as in claim 1, including direct or indirect printing of the cation exchange membrane and removal of solvents contained in the liquid medium and thermal treatment of the membrane coated on both sides, as recited in claim 3.

Thorn teaches coating with carbon black and graphite (col. 5, lines 54-56; and col. 5, lines 53-56). Thorn teaches preparing a liquid dispersion of carbon, graphite (col. 29, Examples 60-61) and an aqueous dispersing medium, applying the liquid dispersion to a surface, and separating substantially all of the aqueous dispersing medium from the carbon and graphite (col. 11, lines 20-32).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the electrode layers described by Merk with wherein the electrode layers of which were produced with a suspension as in claim 1, including direct or indirect printing of the cation exchange membrane and removal of solvents contained in the liquid medium and thermal treatment of the membrane coated

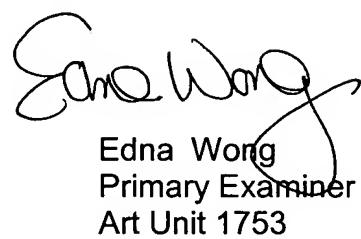
on both sides because preparing a liquid dispersion of carbon, graphite and an aqueous dispersing medium, applying the liquid dispersion to a surface, separating substantially all of the aqueous dispersing medium from the carbon and graphite and drying the carbon and graphite coating would have deposited an electrically conductive coating containing carbon and graphite as taught by Thorn (col. 1, lines 19-25; and col. 11, lines 20-32).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Edna Wong
Primary Examiner
Art Unit 1753

EW
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